Kramer Electronics, Ltd.

USER MANUAL

Model:

VP-81SID

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Congratulations on purchasing your Kramer **VP-81SID** *8x1 Digital STEP-IN Switcher*.

The **VP-81SID** is ideal for:

- Display systems requiring simple input selection
- Remote monitoring of computer activity in schools and businesses
- Rental/staging applications
- Multimedia and presentation source selection

The package includes the following items:

- **VP-81SID** *8x1 Digital STEP-IN Switcher*
- Power cord
- Infrared **RC-IR3** remote control transmitter (including the required battery and a separate user manual[2])
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[3]

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

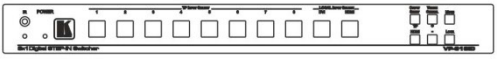
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from http://www.kramerelectronics.com

3 The complete list of Kramer cables is available from http://www.kramerelectronics.com

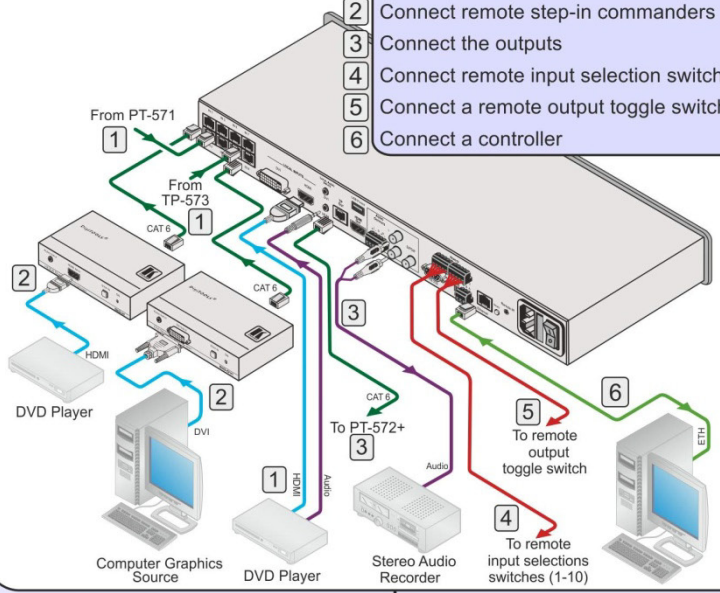
Step 1: Mount the device - see Section 5

Mount the machine in a rack or stick the 4 rubber feet to the underside and place on a shelf



Step 2: Connect the inputs and outputs - see Section 6

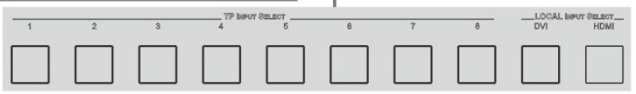
1. Connect the inputs
2. Connect remote step-in commanders
3. Connect the outputs
4. Connect remote input selection switches
5. Connect a remote output toggle switch
6. Connect a controller



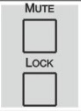
Step 3: Switch the power on

Step 4: Operate the device - see Sections 7, 8 and 9

Select an input with one of the input selector buttons

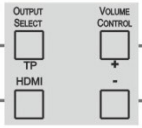


Mute the audio



Lock the front panel buttons

Select an output using one of the OUTPUT SELECT buttons



Increase or decrease the analog audio gain

Operate via the front panel buttons, IR remote controller, RS-232, RS-485 and Ethernet

3 Overview

The **VP-81SID** can route one of eight TP (Twisted Pair), a DVI or an HDMI input to either a TP or an HDMI output. Input selection can also be controlled remotely;

- Using Step-In modules (for example, the **SID-DP**)
- Contact closure switches
- A serial controller via RS-232 or RS-485
- A PC via Ethernet connected over a LAN

The device also outputs balanced and unbalanced stereo audio, as well as digital audio.

In particular, the **VP-81SID**:

- Has a bandwidth of 1.65Gbps per video channel
- Can be cascaded with up to four **VP-81SID** devices via the HDMI port to provide up to 37 Twisted Pair inputs
- Supports the SID range of Step-in Commander panels for remote inputs and remote step-in control
- Has a USB power port that can provide power to USB devices, (for example, the Kramer **KW-11T**)
- Is HDCP compliant
- Provides EDID capture – Copies and stores the EDID from a display device

You can control the **VP-81SID** using the front panel buttons, or remotely via:

- RS-485 or RS-232 serial commands transmitted by a touch screen system, PC or other serial controller
- Ethernet over a LAN
- The Kramer **RC-IR3** Infrared Remote Control Transmitter or the C-A35M/IRR-50 infrared remote extension cable transmitter (optional)

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your **VP-81SID** away from moisture, excessive sunlight and dust

3.1 Defining EDID

The Extended Display Identification Data (EDID[1]) is a data-structure, provided by a display that describes its capabilities to a graphics card (that is connected to the display's source). The EDID enables the PC or laptop to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, product type, timing data supported by the display, display size, luminance data and (for digital displays only) pixel mapping data.

3.2 About HDMI—General Description

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital[2] audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality. Note that Kramer Electronics Limited is an HDMI Adopter and an HDCP Licensee.

In particular, HDMI[3]:

- Provides a simple[4] interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and video monitor, such as a digital flat LCD / plasma television (DTV), over a single lengthy[5] cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio[6] on a single cable
- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements
- Benefits consumers by providing superior, uncompressed digital video quality via a single cable[7], and user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)
- Supports two-way CEC communication between the video source (such as a DVD player) and the digital television, enabling new functionality such as automatic configuration and one-button play

1 Defined by a standard published by the Video Electronics Standards Association (VESA)

2 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

3 HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

4 With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

5 HDMI technology has been designed to use standard copper cable construction at up to 15m

6 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

7 HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

- HDMI has the capacity to support existing high-definition video formats (720p, 1080i, and 1080p, 2K and 4K), standard definition formats such as NTSC or PAL, as well as 480p and 576p.

3.3 About HDCP—General Description

The High-Bandwidth Digital Content Protection (HDCP) standard developed by Intel, protects digital video and audio signals transmitted over DVI or HDMI connections between two HDCP-enabled devices to eliminate the reproduction of copyrighted material. To protect copyright holders (such as movie studios) from having their programs copied and shared, the HDCP standard provides for the secure and encrypted transmission of digital signals.

3.4 About the Power Connect™ Feature

The Power Connect™ feature here means that digital *Step-In Commanders* (for example, the **SID-DP** and **SID-DVI**) do not require an independent power supply if the distance between the **VP-81SID** and the *Step-In Commander* does not exceed 50m (164ft). The Power Connect™ feature applies as long as the cable can carry power. For longer distances heavy gauge cable or a power adapter should be used.

Note: Analog *Step-In Commanders* (for example, the **SID-VGA** and **SID-X1**) do require independent power supplies.

3.5 Using Twisted Pair Cable

Kramer engineers have developed special twisted pair cables to best match our digital twisted pair products; the Kramer **BC-DGKat623** (CAT 6 23 AWG cable), and the Kramer **BC-DGKat7a23** (CAT 7a 23 AWG cable). These specially built cables significantly outperform regular CAT 6/CAT 7a cables.

In applications where plenum cable is required, use the Kramer **BCP-DGKat724** (CAT 7 23 AWG cable).

4 Defining the VP-81SID 8x1 Digital STEP-IN Switcher

Figure 1 and Table 1 define the front panel of the **VP-81SID** *8x1 Digital STEP-IN Switcher*.

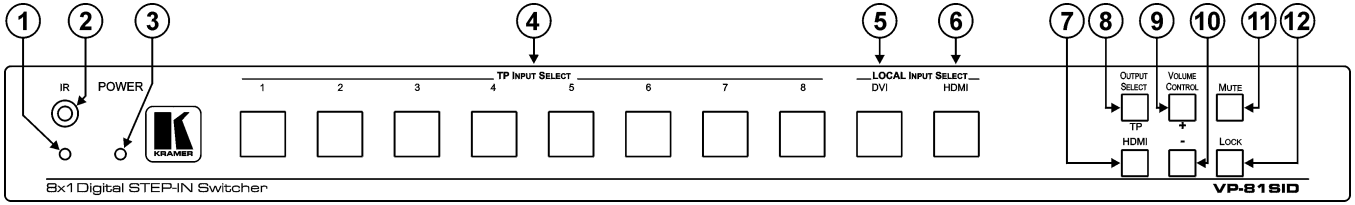


Figure 1: VP-81SID 8x1 Digital STEP-IN Switcher Front Panel

Table 1: VP-81SID 8x1 Digital STEP-IN Switcher Front Panel Features

#	Feature		Function
1	*IR* LED		Lights yellow when receiving an IR signal
2	*IR* Sensor		Receives the signal transmitted by an IR remote control
3	*POWER* LED		Lights green when the device is powered on
4	*TP INPUT SELECT* Buttons (1 to 8)		Press to select one of the TP inputs
5	*LOCAL INPUT SELECT* Buttons	*DVI*	Press to select the DVI input
6		*HDMI*	Press to select the HDMI input
7	*OUTPUT SELECT* Buttons	*HDMI*	Press to select the HDMI output
8		*TP*	Press to select the TP output
9	*VOLUME CONTROL* Buttons	+	Press to increase the analog audio output volume
10		–	Press to decrease the analog audio output volume
11	*MUTE* Button		Press to mute the external audio output
12	*LOCK* Button		Press and hold to lock the front panel buttons. Press and hold again to unlock the buttons

Figure 2 and Table 2 define the rear panel of the **VP-81SID** *8x1 Digital STEP-IN Switcher*.

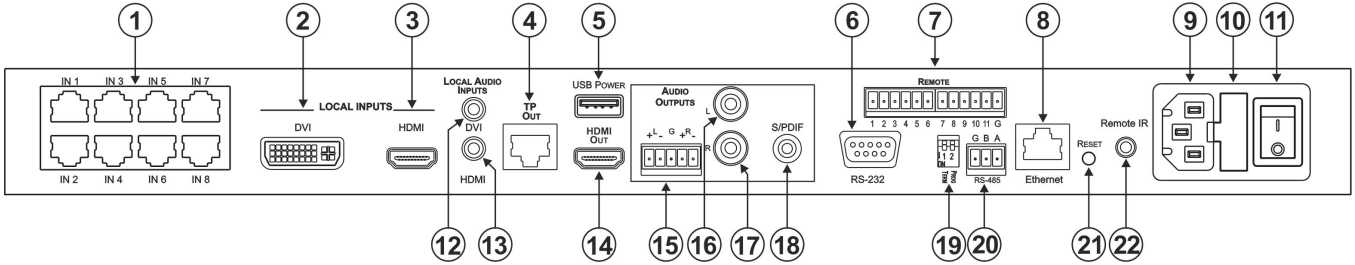


Figure 2: VP-81SID 8x1 Digital STEP-IN Switcher Rear Panel

Table 2: VP-81SID 8x1 Digital STEP-IN Switcher Rear Panel Features

#	Feature		Function
1	TP Input RJ-45 Connectors *IN 1* to *IN 8*		Connect to the remote TP sources (1 to 8) using CAT 6 or higher specification cable. These may be step-in panels (for example, SID-DP) or TP transmitters (for example, the PT-571 or TP-573)
2	*LOCAL INPUTS*	*DVI*	Connect to the local DVI source
3		*HDMI*	Connect to the local HDMI source
4	*TP OUT* RJ-45 Connector		Connect to the remote TP receiver, for example, PT-572+, using CAT 6 or higher specification cable (maximum 50m, 164ft)
5	*USB POWER* Connector		Connect any device requiring USB power, (for example, the Kramer KW-11T)
6	*RS-232* 9-pin D-sub Port (F)		Connect to a serial controller (see Section 6.3)
7	*REMOTE* 12-way Terminal Block		Connect to remote contact closure input and output selection switches (see Section 6.2)
8	*ETHERNET* RJ-45 Connector		Connect to a PC or LAN for remote control via Ethernet (see Section 6.5)
9	AC Mains Power Socket		Connect to the AC mains power
10	AC Mains Fuse		AC mains supply protection fuse
11	AC Mains Power Switch		Turns the AC mains power supply to the device on and off

#	Feature		Function
12	*LOCAL AUDIO INPUTS*	*DVI*	Connect to the local DVI audio source
13		*HDMI*	Connect to the local HDMI audio source
14	*HDMI OUT* Connector		Connect to the local HDMI acceptor
15	*AUDIO OUTPUTS*	*+L–G+R–*	Connect to the balanced audio acceptor (see Section 6.1)
16		*L*	Connect to the unbalanced audio acceptor left channel
17		*R*	Connect to the unbalanced audio acceptor right channel
18		*S/PDIF*	Connect to the digital audio acceptor
19	*PROG TERM* DIP-Switch		DIP-Switch 1: Sets the RS-485 bus termination (see Section 6.4.2) Up = Off, Down = On. Default = On DIP-Switch 2: For the use of Kramer service personnel only
20	*RS-485* 3-way Terminal Block		Connect to RS-485 port on a remote controller or another VP-81SID. Connect: G to Ground, A to A, and B to B (see Section 6.4)
21	*RESET* Button		Press while power-cycling the device to reset parameters to factory default values
22	*REMOTE IR* 3.5mm Mini Jack		Connect to an external IR receiver unit for controlling the device via an IR remote controller (see Section 4.1)

4.1 Using the IR Transmitter for the VP-81SID

You can use the **RC-IR3** IR transmitter to operate the **VP-81SID** via the built-in IR receiver on the front panel or, instead, via an optional external IR receiver[1]. The external IR receiver can be located 15m (49ft) away from the device. This distance can be extended to up to 60m (197ft) when used with three extension cables[2].

Before using the external IR receiver, be sure to arrange for your Kramer dealer to insert the internal IR connection cable[3] with the 3.5mm mini jack that fits into the REMOTE IR opening on the rear panel. Connect the external IR receiver to the REMOTE IR 3.5mm mini jack.

1 Model: C-A35M/IRR-50

2 Model: C-A35M/A35F-50

3 P/N: 505-70434010-S

5 Installing in a Rack

This section describes the preparation and installation of the unit in a rack.

Before installing in a rack, be sure that the environment is within the recommended range:

OPERATING TEMPERATURE:	0º to +55ºC (32º to 131ºF)
STORAGE TEMPERATURE:	-45º to +72ºC (-49º to 162ºF)
HUMIDITY:	10% to 90%, RHL non-condensing

CAUTION!

When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.

2. Once rack mounted, enough air will still flow around the machine.

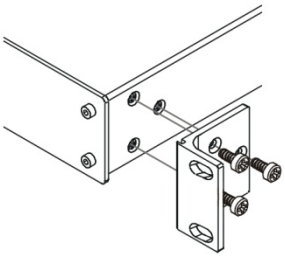
3. The machine is placed straight in the correct horizontal position.

4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.

5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions available from our Web site

6 Connecting the VP-81SID 8x1 Digital STEP-IN Switcher

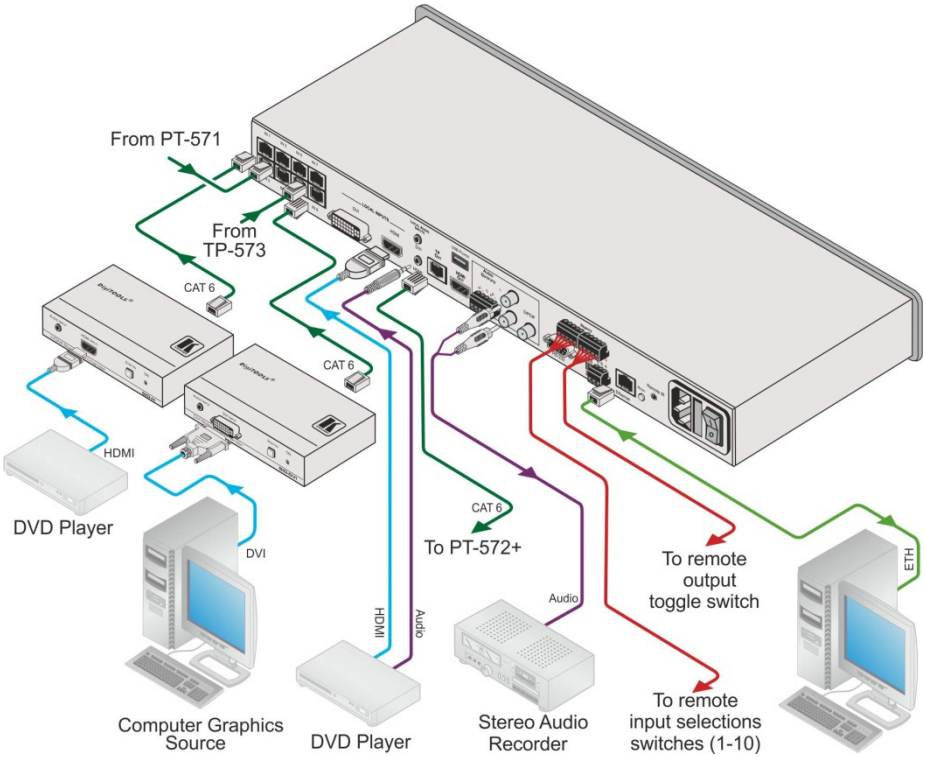


Figure 3: Connecting the VP-81SID 8x1 Digital STEP-IN Switcher

To connect[1] the VP-81SID, as illustrated in the example in Figure 3:

1. Connect up to eight[2] remote Step-in Commanders[3] (for example, the **SID-H** and **SID-DVI** Step-In Commander panels up to 50m (164ft) away) or TP transmitters (for example, the **PT-571** and **TP-573**) to the **VP-81SID** RJ-45 TP INPUT connectors.
2. Connect a DVI video source (for example, a computer graphics source) to the LOCAL INPUTS DVI connector, and the computer's unbalanced stereo audio source to the LOCAL AUDIO INPUT DVI connector.
3. Connect an HDMI video source to the LOCAL INPUTS HDMI connector.

1 Be sure that the power is switched off to each device before connecting it to your VP-81SID. After connecting all the devices to your VP-81SID, switch on the power to the VP-81SID, and then switch on the power to each device

2 You do not have to connect all the inputs

3 Any combination of Step-In panels and TP transmitters up to a maximum of eight

4. Connect the TP OUT RJ-45 connector to a compatible TP receiver up to 50m (164ft), for example, **PT-572+**.
5. Connect the S/PDIF RCA digital audio output to an audio acceptor (for example, a DAT recorder).
6. Connect the balanced audio 5-pin terminal block (see Section 6.1) to an audio acceptor (for example, a balanced stereo audio amplifier).
7. Optional—Connect up to ten remote, contact closure input selection switches to the REMOTE terminal block (see Section 6.2).
8. Optional—Connect the Ethernet RJ-45 TP port directly or via a LAN to a PC controller.

   Alternatively, you can connect a PC and/or controller to the:
   - RS-232 port (see Section 6.3)
   - RS-485 port (see Section 6.4)
9. Connect the power cord[1].

Note: When signal sources are disconnected from inputs, signal acceptors (for example, a projector) may not go into standby mode automatically. We therefore recommend that you turn off the **VP-81SID** and/or the acceptor.

Note: When using the **PT-572+** in conjunction with the **VP-81SID** do not connect the 12V power supply to the **PT-572+**.

6.1 Connecting to a Balanced Audio Acceptor

Figure 4 illustrates how to wire devices to the balanced audio output.

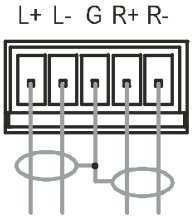


Figure 4: Balanced Stereo Audio Output Connection

6.2 Connecting Remote Contact Input and Output Selection Switches

You can connect remote, contact closure input selection switches to the REMOTE terminal block on the rear panel of the **VP-81SID**. Remote input selection switches provide the ability to remotely activate the inputs and an output.

Table 3 lists the remote contact terminal block connections.

1 We recommend that you use only the power cord that is supplied with the device

Table 3: Remote Contact Terminal Block Connections

Terminal Number	Description
1	Connect to ground to select input 1
2	Connect to ground to select input 2
3	Connect to ground to select input 3
4	Connect to ground to select input 4
5	Connect to ground to select input 5
6	Connect to ground to select input 6
7	Connect to ground to select input 7
8	Connect to ground to select input 8
9	Connect to ground to select input 9
10	Connect to ground to select input 10
11	Connect to ground to toggle between output 1 and output 2
G	Ground

The following example (see Figure 5) illustrates three switches (1, 8 and A) connected so as to remotely control inputs 1 and 8, and select an output respectively. Connected as shown, pressing switch 1 causes input 1 on the **VP-81SID** to be the active input, and pressing switch 8 causes input 8 to be the active input. Pressing switch A causes the output selection to toggle between the TP and HDMI outputs.

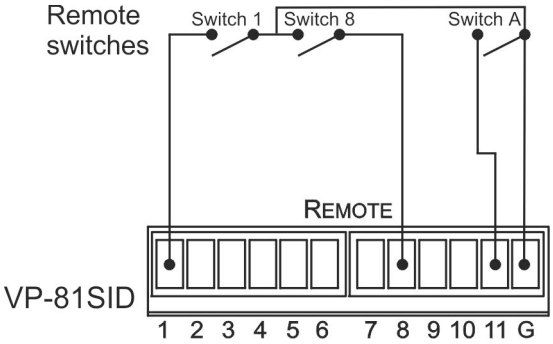


Figure 5: Remote Input Selection Switch Wiring

To connect remote input/output selection switches as illustrated in the example in Figure 5:

1. Connect Switch 1 to pins 1 and G on the terminal block (remote step-in for input 1).
2. Connect Switch 8 to pins 8 and G on the terminal block (remote step-in for input 8).
3. Connect Switch A to pins 11 and G on the terminal block (remote output selection toggle).

6.3 Connecting to the VP-81SID via the RS-232 Port

You can connect to the **VP-81SID** via an RS-232 connection using, for example, a PC (see Section 12). Note that a null-modem adapter/connection is not required.

To connect to the **VP-81SID** via RS-232:

- Connect the RS-232 9-pin D-sub rear panel port on the **VP-81SID** unit via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC

6.4 Connecting to the VP-81SID via the RS-485 Port

You can operate the **VP-81SID** via the RS-485 port from a distance of up to 1200m (3900ft) using any device equipped with an RS-485 port (for example, a PC). For successful communication, you must set the RS-485 machine number and bus termination.

To connect a device with a RS-485 port to the VP-81SID:

1. Connect the TxD+ pin on the RS-485 port of the PC to the A pin on the RS-485 port on the rear panel of the **VP-81SID**.
2. Connect the TxD– pin on the RS-485 port of the PC to the B pin on the RS-485 port on the rear panel of the **VP-81SID**.
3. If shielded TP cable is used, the shield may be connected to the G (ground) pin on the unit.

6.4.1 Setting the RS-485 Machine Number

The machine number on the RS-485 bus can be set to between 1 and 4 and can be set using the front panel buttons.

To set the RS-485 machine number using the front panel buttons:

1. Press the Lock button until the button lights.
   The front panel buttons are locked.
2. Press the Local Input Select HDMI and Mute buttons at the same time.
   The TP Input Select buttons flash.
3. Press the TP Input Select button number (1 to 4) for the required machine number.
   The TP Input Select buttons stop flashing and the selected TP Input Select button lights.
4. Press the Lock button until the button is no longer lit.
   The selected machine number is set and front panel buttons are unlocked.

6.4.2 Setting the RS-485 Bus Termination

Figure 6 illustrates the factory default DIP-switch positions.

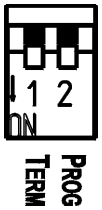


Figure 6: RS-485 Termination DIP-switch

DIP-switch 1 sets the RS-485 bus termination of the **VP-81SID**. Only the first and last physical units on the RS-485 bus must be terminated, all others must be unterminated. Moving the DIP-switch up turns the termination off (default), moving the switch down enables the termination.

6.4.3 Connecting and Controlling Multiple VP-81SID Devices

You can connect up to four **VP-81SID** devices with operation via RS-232 (as shown in the example in Figure 7) or Ethernet. Connecting four devices provides 37 inputs.

To connect up to four VP-81SID devices:

1. Connect the RS-232 port[1] on the first **VP-81SID** device to the PC (see Section 6.3).
2. Connect the RS-485 terminal block port on the first device to the RS-485 port on the second device, and so on for all devices. (Connect A to A, B to B, and G to G.)
3. Connect the HDMI LOCAL INPUT on the first device to the HDMI OUT on the second device, and so on for all devices.
4. Set the machine number and termination as follows:
   - The first device is machine number 1 and the subsequent three devices are machine numbers 2 to 4 (see Section 6.4.1)
   - Terminate the first and last devices, that is, terminate machine numbers 1 and 4 (see Section 6.4.2). Ensure that all other devices are left unterminated

1 Alternatively, the RS-485 port could be used for PC control

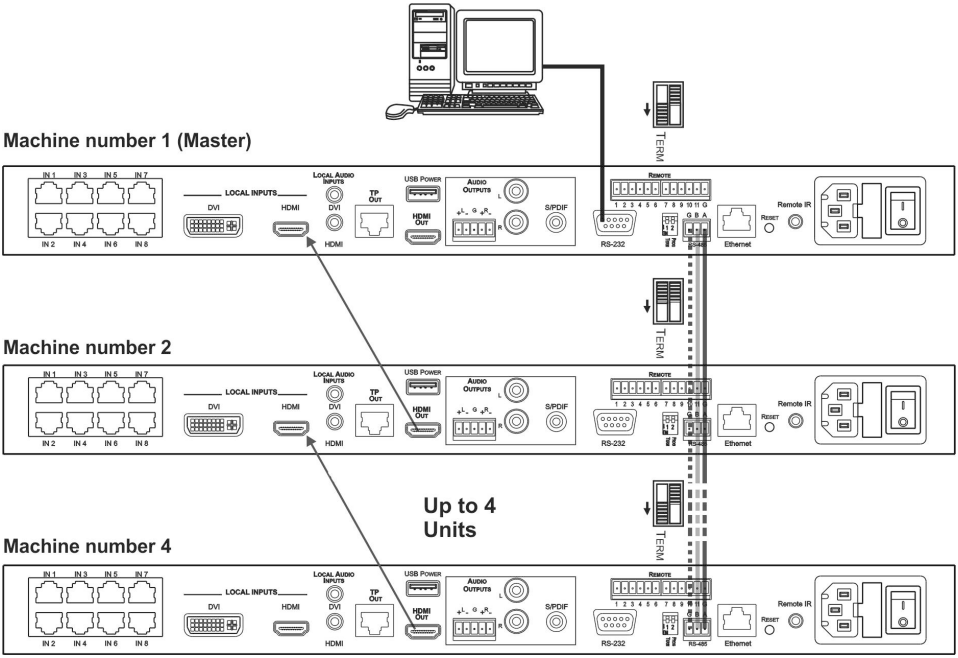


Figure 7: Control of Multiple VP-81SID Devices via RS-232 and RS-485

6.5 Connecting to the VP-81SID via the Ethernet Port

You can connect the **VP-81SID** via Ethernet in the following ways:

- For direct connection to the PC, use a crossover cable (see Section 6.5.1)
- For connection via a network hub or network router, use a straight through cable (see Section 6.5.2)

Note: The following instructions are valid only if your PC uses a fixed IP address. If your PC receives an IP address from a DHCP server, consult your IT department regarding a suitable IP address.

6.5.1 Connecting Directly to the Ethernet Port

You can connect the Ethernet port of the **VP-81SID** to the Ethernet port on your PC via a crossover cable with RJ-45 connectors.

This type of connection is recommended for identification of the factory default IP address of the **VP-81SID** during the initial configuration

To connect the VP-81SID directly to a PC:

1. Using a crossover cable, connect the **VP-81SID** to the PC via the Ethernet port on both units.
2. On the PC, click **Start** > **Control Panel.**

3. Double-click **Network Connections.**
4. Right-click, and from the menu select **Properties**.
   The **Local Area Connection Properties** window appears.

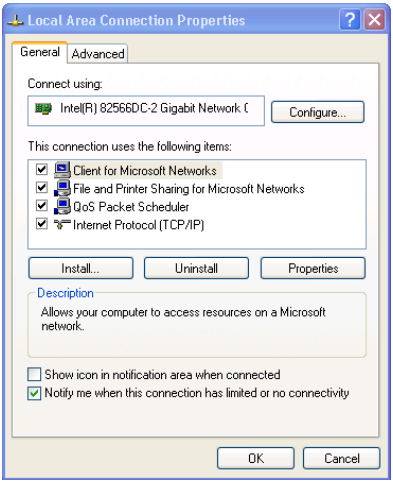


Figure 8: Local Area Connection Properties Window

5. Select **Internet Protocol (TCP/IP)** (see Figure 8).
6. Click the **Properties** button.
7. Select **Use the following IP address**, and fill in the details as shown in Figure 9. You can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.39) that is provided by your IT department.

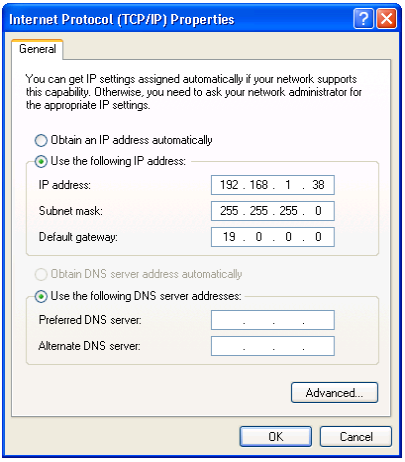

Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 38
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 19 . 0 . 0 . 0
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Figure 9: Internet Protocol (TCP/IP) Properties Window

8. Click **OK**.

6.5.2 Connecting via a Network Hub, Switch, or Router

You can connect the Ethernet port of the **VP-81SID** to the Ethernet port on a network hub, switch, or router, via a straight through cable with RJ-45 connectors. The **VP-81SID** Ethernet port has to be configured to be compatible with your network (see Section 8.1.13).

7 Operating the VP-81SID Locally via the Front Panel Buttons

Powering up the **VP-81SID** recalls the last settings (that is, the configuration of the device when it was powered down) from the non-volatile memory.

7.1 Selecting an Input

The input buttons illuminate to indicate the following:

- Off indicates the input is not selected
- On indicates the input is selected
- Flashing indicates that you have tried to select the input but another input with a higher priority is currently selected

To select an input:

- Press one of the ten front panel Input Select buttons. The selected button lights

Note: Pressing an active input button mutes the input. Pressing the button again unmutes the input.

Note: The priority of each input can be set individually using the Step-In Commander panel.

7.2 Muting the Input when using Step-In Commanders

To mute and unmute the input when using a Step-In Commander:

1. Press the Input Select button on the Step-In Commander.
   The input is selected and the buttons lights.
2. Press the Step In button on the Step-In Commander.
   The input is muted and the button no longer lights.
3. Press the Step In button on the Step-In Commander a second time.
   The input is unmuted and the button lights.

7.3 Resetting all Input Priorities to the Default

To reset all input priorities to the default priority (10):

1. Press the Lock button until the button lights.
   The front panel buttons are locked.

2. Press the Volume Control + and – buttons at the same time.
   All the TP Input Select buttons flash. When they stop flashing, the input priorities have been reset to their defaults.

7.4 Selecting an Output

To select an output:

- Press one of the two front panel Output Select buttons.
  The selected button lights.

7.5 Setting the Audio Output Volume

To set the audio output volume:

- Press either the Volume Control + (to increase the volume) or the Volume Control – (to decrease the volume) button.

To mute the audio output:

- Press the Mute button.
  The button lights and the audio is muted.

7.6 Locking and Unlock the Front Panel Buttons

To lock and unlock the front panel buttons:

1. Press the Lock button until it lights.
   The front panel buttons are locked.
2. Press the Lock button until it no longer lights.
   The front panel buttons are unlocked.

7.7 Muting the Audio

To mute and unmute the audio on an input:

1. Press the Mute button on the front panel of the **VP-81SID**.
   The audio is muted and the button lights.
2. Press the Mute button on the front panel of the **VP-81SID** a second time.
   The audio is unmuted and the button no longer lights.

7.8 Muting the Audio on an Active Input.

To mute and unmute the audio on an active input:

1. Press the Input button of the active input.
   The button flashes and the input is muted.
2. Press the Input button a second time.
   The input is unmuted and the button lights.

8 Operating the VP-81SID Remotely

The **VP-81SID** can be operated remotely via any of the following methods:

- The Step-in Controller software (see Section 8.1)
- Step-In Commander panels
- Contact closure switches (for connecting, see Section 6.2)
- RS-485 (for connecting, see Section 6.4) or RS-232 (for connecting, see Section 6.3) serial commands transmitted by a touch screen system, PC or other serial controller
- Ethernet over a LAN (for connecting, see Section 6.5)
- Remotely using the Kramer **RC-IR3** Infrared Remote Control Transmitter (refer to the **RC-IR3** user manual) or the infrared remote extension cable transmitter
- The embedded Web pages (see Section 9)

8.1 VP-81SID Step-In Controller Software

The Step-In Software requires the following:

- Windows™ XP, Vista or Windows™ 7
- Microsoft .Net Framework version 3

To install the Step-In Software, download the software and run the setup file. After installation, running the Step-In Software for the first time displays a window similar to that shown in Figure 10.

The **VP-81SID** can operate in either the secure mode or the unsecure mode. The factory default mode is unsecure. To change the mode, see Section 14.12.33. In the secure mode, access can be via either Admin or User (see Section 8.1.1). When in unsecure mode, full access is granted without Admin authorization.

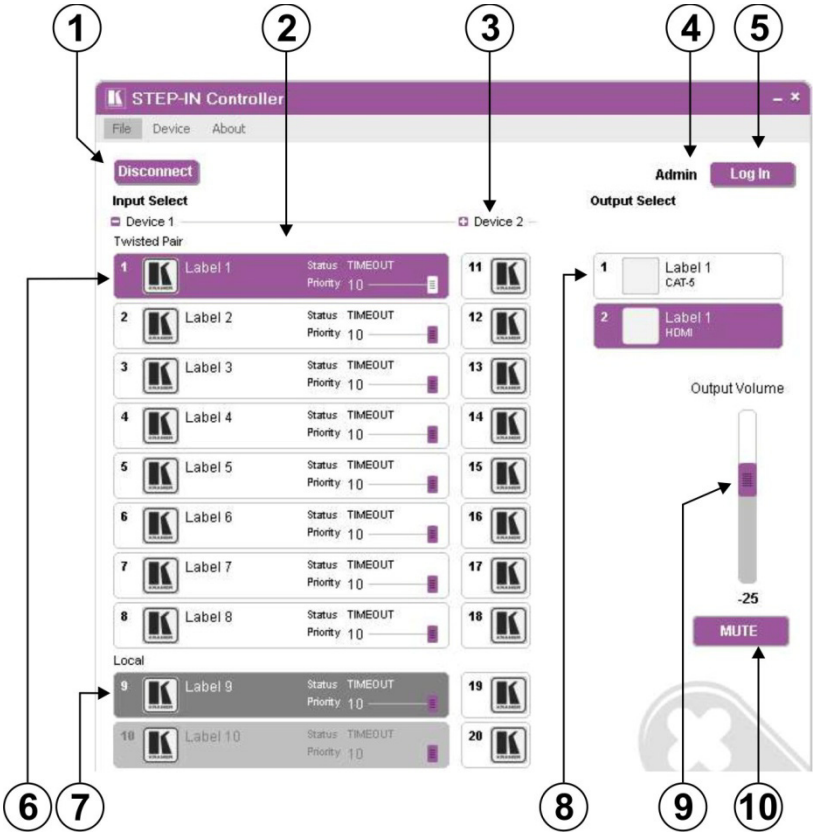


Figure 10: Step-In Software Main Window

Table 4: Main Window Features

#	Feature	Function
1	*Connect/Disconnect* Button	Click to connect to or disconnect from the device (see Section 8.1.4)
2	Selected Input Buttons	Click to select an input. The selected input button is highlighted
3	*Device 2* Cascaded Device(s)	Inputs of any cascaded devices
4	Current User Label	Indicates which user is currently logged in (see Section 8.1.3)
5	*Log In* Button	Click to log in (see Section 8.1.3)
6	*Inputs Twisted Pair* Buttons	Click one of the eight remote Twisted Pair input buttons to select an input (see Section 6.3)
7	*Local* Input Buttons	Click one of the two local input buttons to select an input (see Section 6.3)
8	*Outputs* Buttons	Click one of the two output buttons to select an output (see Section 8.1.5)
9	*Output Volume* Slider	Click, hold and move the slider up (higher) or down (lower) to adjust the output volume (see Section 6.3)
10	*Mute on/off* Button	Click to mute/unmute the output volume (see Section 8.1.7)

Note: When a change is made on the device (for example, a different output is selected), the change is reflected almost immediately in the main window of the Step-in Software, and visa versa.

Figure 11 shows a typical input button.

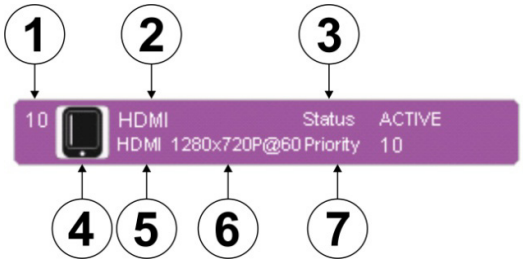


Figure 11: Typical Input Button

Table 5: Button Characteristics

#	Feature	Description
1	*10*	Input (1–10) or output (1–2) channel number
2	*HDMI* Label	User-selectable button label, Admin only (see Section 6.3)
3	*Status ACTIVE*	Indicates the status of the connection and signal on the channel: TIMEOUT—no cable MUTE— cable present, no signal detected WAIT— cable and signal present but channel is not selected ACTIVE—cable and signal present and channel is selected (only one channel at a time)
4		User-selectable icon selected to be displayed on the button, Admin only (see Section 8.1.10)
5	*HDMI*	Video input type: VGA, HDMI, DP, DVI
6	*1280x720p@60*	Video resolution, i=interlace/p=progressive, refresh rate
7	*Priority 10* Slider	Slider for adjusting the priority (1, lowest–10, highest) of the input, Admin only (see Section 8.1.5)

8.1.1 Authorized Users

By default, you are logged in as User and you can:

- Select an active input or output
- Adjust or mute/unmute the output volume
- Change the device name
- Modify the IP configuration

Options that you are not authorized to perform are grayed out.

When logged in as Admin, in addition to the User abilities, you can:

- Modify the input priorities (see Section 8.1.9)
- Modify the input/output button characteristics (see Section 8.1.10)
- Upgrade the device firmware (see Section 8.1.5)
- Reset the device (see Section 8.1.12)

- Change the User and Admin Passwords
- Enable/disable IR control

Note: Any actions that you are not authorized to perform are grayed out.

8.1.2 The Step-in Software Menu Bar

The menu bar options are shown in Table 6.

Table 6: Menu Bar Options

Menu Bar Options	Sub Menu	Description
FILE	Connect/Disconnect	Connect or disconnect to the device
	Exit	Exit the Step-in software
DEVICE	Details	Retrieve and display the device details, such as, model, unit name, version, and so on
	Change Admin Password	Change the Admin password
	Cascade	Select the number of cascaded devices
	Firmware Update	Update the device firmware using a new firmware file (Admin only)
	Change Unit Password	Change the Admin user password (Admin only)
	Reset	Power cycle the device (Admin only)
	IR Status	Enable or disable the IR control for the device
ABOUT	NA	Displays the Step-in Software and Kramer company details

8.1.3 Logging in as Admin

To log in as admin:

1. Click the **Log In** button.
   The **Log In** window appears as shown in Figure 12.

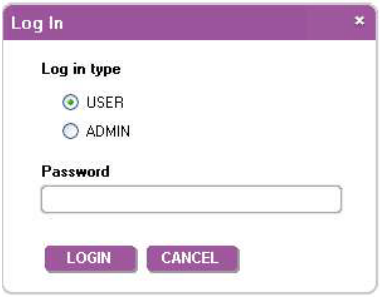


Figure 12: Log In Window

2. Select either User or Admin using the radio buttons.
3. Enter the password.
   The main window is displayed and the user shown is **Admin**.
4. To log out, click **Log Out**.

Note: By default there is no Admin password. To change the Admin password, see Section 9.5.

8.1.4 Connecting to the Device

To connect to the device:

1. Click the **Connect** button.
   The **Connection Method** window is displayed as shown in Figure 13.

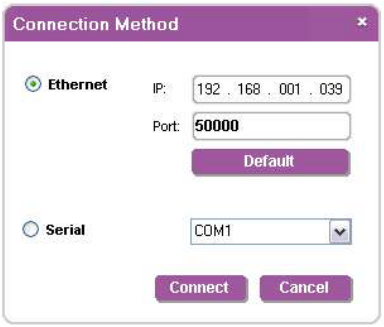


Figure 13: Connection Method Window

2. Select the connection method (via Ethernet over a LAN or a serial connection) by clicking the relevant radio button.
3. For Ethernet, enter the IP address and Port number of the device and click **Connect**.
   To set the default IP address and Port number, press the **Default** button.
4. For a serial connection, select the required Com port from the drop-down list.
5. Click **Connect**.
   If the connection is successful, the window shown in Figure 10 appears. If the connection is not successful, a Timeout error message appears.

8.1.5 Switching an Input to an Output

To switch an input to an output:

1. Click on the required twisted-pair or local input to switch.
   The input is selected and the button changes to solid purple as shown in Figure 17.

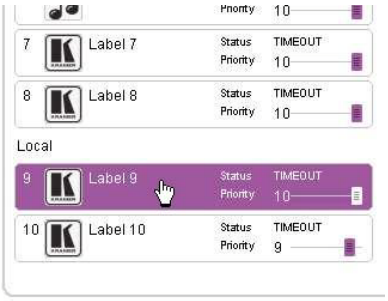

Priority 10
7 Label 7 Status TIMEOUT Priority 10
8 Label 8 Status TIMEOUT Priority 10
Local
9 Label 9 Status TIMEOUT Priority 10
10 Label 10 Status TIMEOUT Priority 9

Figure 14: Input Selection

2. Click on the required output to select.
   The switch selection is made and the button changes to solid purple.

Note: To switch an input to an output, you can click on either an input or an output first, the order is not important.

8.1.6 Switching and Selecting an Input when using the SID-X1

To switch an input to an output:

1. Click on the TP input to which the **SID-X1** is connected.
   The switch selection is made and the button changes to solid purple.
2. Right-click on the input.
   The InputPropertiesForm screen is shown as in Figure 15.

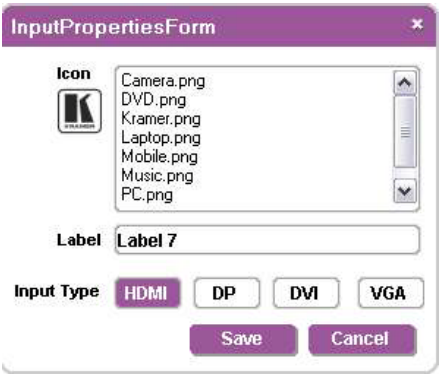


Figure 15: SID-X1 Input Selection

3. Click on the required **Input Type** button.
   The input type selection is made and the button changes to solid purple.
4. Click **Save**.
   The Input type is selected on the **SID-X1**.

8.1.7 Changing the Output Volume

To change the output volume:

1. Click and hold on the **Output Volume** slider as shown in Figure 17.

Figure 16: Changing the Output Volume

2. Drag up to increase or down to decrease the output volume.
   The volume level changes accordingly.

8.1.8 Muting the Audio Output

To mute the audio output:

1. Click the **Mute** button.
   The button changes to purple and the audio is muted.
2. Click the colored **Mute** button to unmute the audio.
   The button changes to white and the audio is unmuted.

8.1.9 Changing the Priority of an Input

The priority of an input determines whether another input that is selected can take control from it, where 1 is the lowest and 10 is the highest priority. For example, input 4 has a priority of 2 and input 8 has a priority of 5. If input 8 is currently selected, input 4 cannot take control. In this case, if you press input 4, the button flashes for a few seconds and then goes off, indicating that input 4 is not selected.

To change the input priority you must be logged in as Admin.

To change the priority of an input:

- Click, hold and move the **Priority** slider on the relevant input to the required priority, right to increase and left to decrease the priority.

8.1.10 Changing the Input and Output Button Icons and Labels

To change the input/output button icons and labels you must be logged in as Admin.

To change an input/output button icon and label:

1. Right-click on the relevant button.
   The button **Input Properties** window appears as shown in Figure 17.

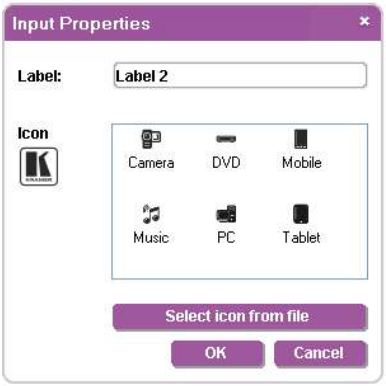


Figure 17: Input Button Properties Window

2. In the **Label** text field, enter the required button label.
3. Either:
   - Select the required icon from the list (you can save custom icons in the *\Kramer Electronics\StepIn Controller\Images* directory)
     OR
   - Click **Select icon from file** and browse to the icon directory
4. Click **OK**.
   The button characteristics are changed.

8.1.11 Updating the Firmware

To update the firmware you must be logged in as Admin.

To update the firmware:

1. Download the latest firmware file from http:www.kramerelectronics.com.
2. Click **Unit** > **Firmware Update**.
3. Browse to the firmware file that you downloaded.
4. Click **Open**.
   The device firmware is loaded.
   Note: Do not interrupt the uploading process or the device may be damaged.
5. When the process is complete, reset the device (see Section 8.1.12).

8.1.12 Resetting the Device

To reset the device you must be logged in as Admin.

To reset the device:

1. Click **Unit** > **Reset**.

2. Click **OK**.
   The device is reset.

8.1.13 Setting the IP Network Parameters

To set the IP network parameters you must be logged in as Admin.

To set the IP network parameters:

1. Click **Unit** > **Device Details**.
2. Under **Connectivity**, edit the required parameter.
3. Click **Set Value**.
   A confirmation message appears.
4. Click **OK**.
   The parameter is set.
5. Reset the device (see Section 8.1.13).

8.1.14 Setting Multiple Cascaded Devices

You can control up to four devices via a single RS-232 or Ethernet connection using the Step-In Software. Control of multiple devices is the same as for a single device but you must first set the number of devices. The main window (see Figure 10) then displays an extra column of input buttons for each device.

The number of devices can be set manually or automatically. We recommend that you set the number of devices manually as the auto-scanning procedure can take some time.

To set the number of devices:

1. From the menu bar, click **Unit**.
2. From the options, click **Cascade**.
3. Either:
   - Manually select the number of devices
     OR
   - Select **Auto.**
     The Step-In Software scans the RS-485 bus for active devices. This may take a few minutes

8.1.15 Changing the Admin Password

By default, there is no Admin password. To change the Admin password, use the embedded Web pages (see Section 9.5). You can only change the Admin password if you are logged in as Admin.

9 Operating the VP-81SID Remotely via the Embedded Web Pages

The embedded Web pages can be used to remotely operate the **VP-81SID** using a Web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures in Section 6.5.
- Ensure that the Java™ software is installed and functioning correctly on your computer. If not, download it from www.java.com
- Ensure that your browser is supported—Microsoft IE (V6.0 and higher), Google Chrome, Firefox (V3.0 and higher).

To check that Java is installed and running correctly, browse to http://www.java.com/en/download/help/testvm.xml

This page runs a test and displays a Java success (see Figure 18) or failure message.

Figure 18: Java Test Page Success Message

If you do not see the success message, follow the instructions on the page to:

- Load and enable Java
- Enable Javascript in your browser

9.1 To Log On to the VP-81SID Web Pages

To log on to VP-81SID Web pages:

1. Open your Internet browser.
2. Type the unit's IP number (see Table 11) in the Address bar of your browser.

The **Loading** page appears.

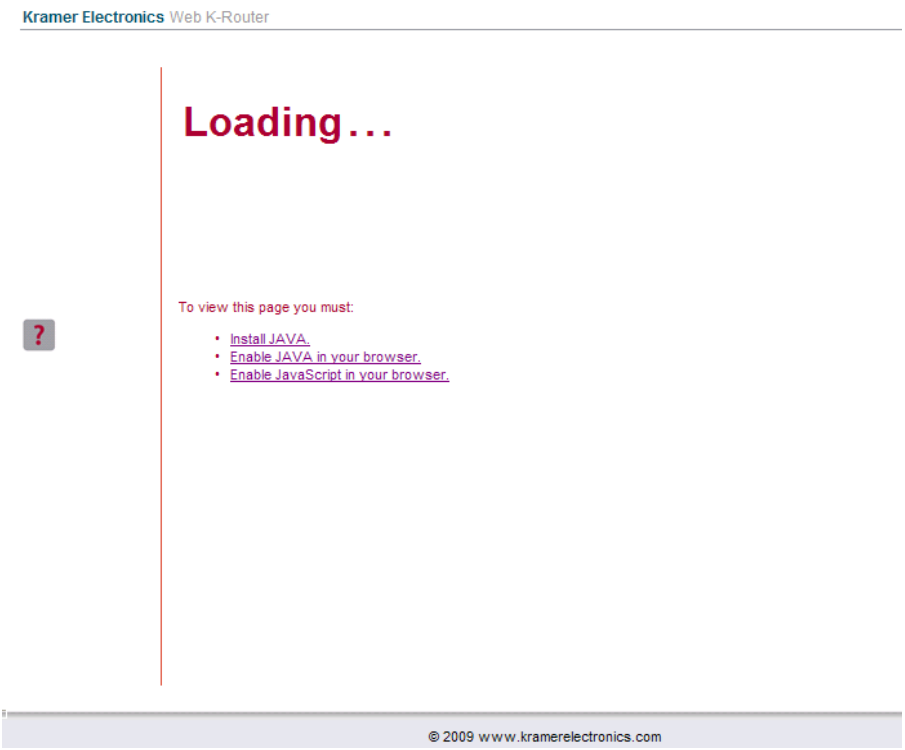


Figure 19: The Loading Page

The first time that you run the program, the Warning-Security screen appears.

Warning - Security
The application's digital signature cannot be verified.
Do you want to run the application?
Name: K_Applet
Publisher: Kramer Electronics
From: http://192.168.1.39
Always trust content from this publisher.
Run
Cancel
The digital signature cannot be verified by a trusted source. Only run if you trust the origin of the application.
More Information...

Figure 20: First Time Security Warning

3. Click **Run**.
   The main switching control Home page is displayed which shows a graphical interpretation of the front panel (see Figure 21).

The Web pages let you control the **VP-81SID** via Ethernet over a LAN. There are four Web pages:

- The **Panel** page (see Section 9.2)
- The **Audio Volume** page (see Section 9.3)
- The **Priority** page (See Section 9.4)
- The **Settings** page (see Section 9.5)

9.2 The VP-81SID Panel Page

The **VP-81SID Panel** page lets you perform operational actions, such as, switching inputs/outputs and locking the front panel buttons.

Note: Options that are grayed out indicate insufficient user privileges (see Section 9.2.1).

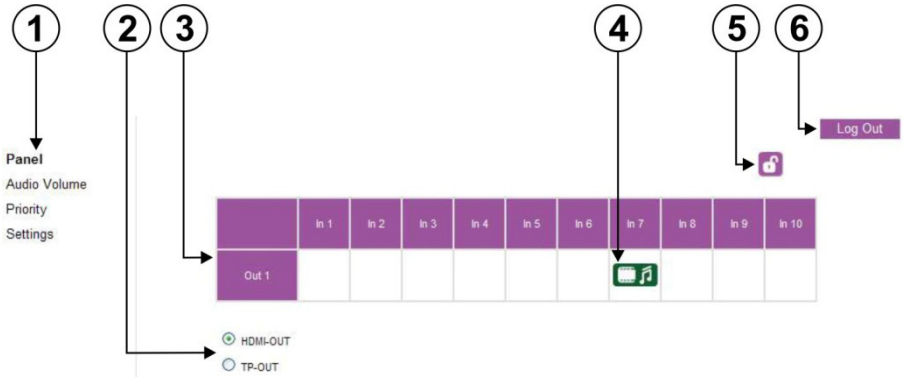


Figure 21: VP-81SID Panel Page

Table 7: VP-81SID Panel Page Features

#	Feature	Function
1	Page Name	Indicates the current page
2	Output Radio Buttons (HDMI and Twisted Pair)	Click to select an output (see Section 9.2.2)
3	Input Selection (In 1 to In 10)	Click to select an input (see Section 9.2.2)
4	Currently Selected Input	Indicates the currently selected input
5	Lock Button	Click to lock the front panel buttons (see Section 9.2.4)
6	*Log In/Log Out* Button	Click to log on and log out (see Section 9.2.1)

9.2.1 Logging In to the Software

See Section 8.1.1 for a description of authorized users.

When security is disabled (see Section 9.5), no user authentication is performed and all options are available for modification. When security is enabled, authentication is by User or Admin privileges and some options have restricted access.

Figure 22: Logging In

To log in:

1. From the **Login as** drop-down list, select either **User** or **Admin**.
2. In the **Password** field enter your password.
3. Click **Login**.

9.2.2 Selecting an Input

To select an input:

- Click in the square underneath the required **Input**.
  The selected input icon is placed in the square and the input becomes active.

Figure 23: Selecting an Input

9.2.3 Selecting an Output

To select an output:

- Click the radio button of the required **Output**.
  The selected output becomes active.

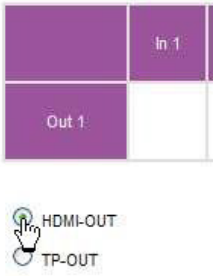


Figure 24: Selecting an Output

9.2.4 Locking the Front Panel Buttons

To lock the front panel buttons:

- Click on the lock icon.
  The front panel buttons are locked. To unlock the front panel buttons, click on the lock icon again

Figure 25: Locking the Front Panel Buttons

9.3 The VP-81SID Audio Volume Page

The **VP-81SID Audio Volume** page lets you adjust the audio output volume.

Figure 26: VP-81SID Audio Volume Page

To change the volume of the audio output:

- Click on the + (to increase) or on the – (to decrease) button of the **Output Volume**

9.4 The VP-81SID Priority Page

The **VP-81SID Priority** page lets you set the input priority.

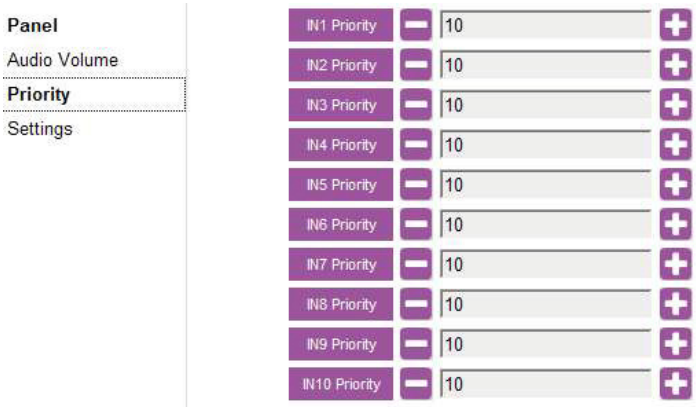


Figure 27: VP-81SID Priority Page

To change the priority of an input:

- Click on the + (to increase) or on the – (to decrease) button of the input whose priority you want to modify

9.5 The VP-81SID Settings Page

The **VP-81SID Settings** page lets you configure the device configuration settings, such as, device name and IP settings.

Note: Throughout this section options that are not available for an unauthorized user are grayed out.

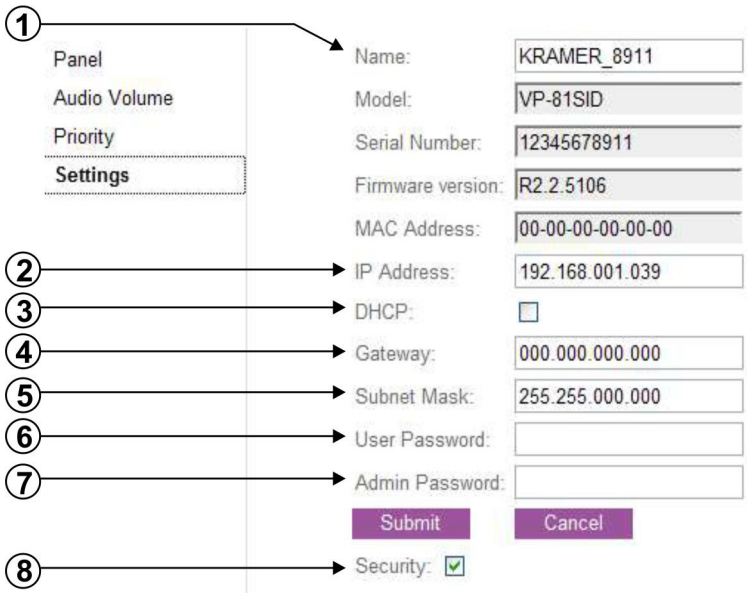


Figure 28: VP-81SID Settings Page

Table 8: VP-81SID Settings Page Features

#	Feature	Function
1	*Name*	The name of the device
2	*IP Address*	The IP address of the device
3	*DHCP*	Check the box to configure the device to request an IP address from a DHCP server
4	*Gateway*	The gateway address of the device
5	*Subnet Mask*	The subnet mask of the device
6	*User Password*	The User password of the device
7	*Admin Password*	The Admin password of the device
8	*Security*	Check the box to enable User/Admin security

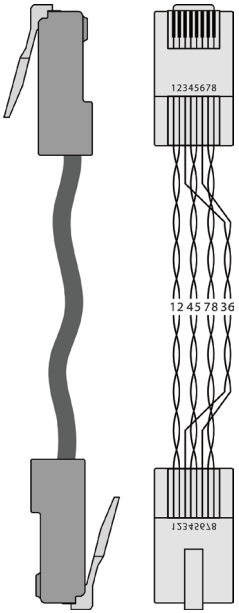
10 Wiring the TP RJ-45 Connectors

Table 9 and Figure 29 define the TP pinout, using a straight pin-to-pin cable with RJ-45 connectors (**note that the cable Ground shielding must be connected/soldered to the connector shield**).

Table 9: TP PINOUT

EIA /TIA 568B	
PIN	**PIN**
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	1 and 2
Pair 3	3 and 6
Pair 4	7 and 8

Figure 29: TP Pinout Wiring



11 Technical Specifications

Table 10 lists the technical specifications[1] of the **VP-81SID**.

Table 10: Technical Specifications of the VP-81SID

INPUTS:	Video: 8 TP on RJ-45 connectors 1 DVI-D, 1.2Vpp on a DVI Molex 24-pin (F) connector; DDC signal 5Vpp (TTL) 1 HDMI connector	Audio: 2 Unbalanced stereo audio (1 for DVI and 1 for HDMI) on 3.5mm mini jacks
OUTPUTS:	Video: 1 TP on an RJ-45 connector 1 HDMI connector	Audio: 1 balanced stereo audio on a 5-pin detachable terminal block 1 unbalanced stereo audio on 2 RCA connectors 1 digital audio on an RCA connector
	USB Power: 5V DC USB power	
BANDWIDTH:	1.65Gbps per channel	
STANDARDS:	HDMI with Deep Color, x.v.Color™ and 3D	
STEP-IN COMMANDER DISTANCE:	50m (164ft) up to 1080p @60Hz	
OUTPUT DISTANCE:	50m (164ft) up to 1080p @60Hz	
POWER CONSUMPTION:	100-240V AC 50/60Hz 70VA	
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)	
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)	
HUMIDITY:	10% to 90%, RHL non-condensing	
DIMENSIONS:	43.7cm x 18.1cm x 4.4cm (17.2" x 7.1" x 1.7") W, D, H rack-mountable	
WEIGHT:	2.0kg (4.4lbs) approx.	
ACCESSORIES:	Power cord, Windows®-based Kramer control software, RC-IR3 Infrared Remote Control transmitter	
OPTIONS:	External remote IR receiver cable[2]; 15m extension cable[3]	
REMOTE STEP-IN SWITCHES	SID-VGA, SID-DP, SID-DVI, SID-H, SID-X1	

1 Specifications are subject to change without notice

2 P/N: C-A35M/IRR-50

3 P/N: C-A35M/A35F-50

12 Default Communication Parameters

Table 11 lists the default communication parameters for the **VP-81SID**.

Table 11: Communication Parameters

RS-232	
Protocol 3000	
Baud Rate:	115200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (Output 2 to Input 4):	#AV 4>2<CR>
Factory Default Ethernet Values	
To reset the IP settings to the factory reset values, power cycle the device while holding in the Factory Reset button, located on the rear panel of the unit	
IP Address:	192.168.1.39
Subnet mask:	255.255.255.0
Default gateway:	192.168.1.1
TCP Port #: 5000	5000
UDP Port #: 50000	50000
Maximum UDP Ports:	10
Maximum TCP Ports:	4

13 Default EDID

Each input on the **VP-81SID** is loaded with an EDID detected on output. If no output EDID is detected, factory default will be used.

```
Monitor
   Model name..... VP-81SID
   Manufacturer Name = KRM
   Product Code = 4608
   Serial Number = 16843009
   Week of Manufacture = 255
   Year of Manufacture = 2011
   EDID Version = 1.3

   --- Video Input Definition ---
   Signal Type = Digital
   DFP 1.x = Not Compatible

   --- Basic Display Parameters ---
   Max Horizontal Size(cm) = 52
   Max Vertical Size(cm) = 32
   Gamma Value = 2.20

   --- Display Features ---
   Standby Mode = Supported
   Suspend Mode = Supported
   Active Off Mode = Supported
   Display Type = RGB
   Color Space = Alternate
   Preferred Timing = 1st Detail
   GTF Timing = Not Supported

   --- Color Characteristics ---
   Red x = 0.674
   Red y = 0.318
```

Green x = 0.188
Green y = 0.705
Blue x = 0.148
Blue y = 0.064
White x = 0.313
White y = 0.328

--- Established Timing I ---
[v]720x400@70 [v]720x400@88
[v]640x480@60 [v]640x480@67
[v]640x480@72 [v]640x480@75
[v]800x600@56 [v]800x600@60

--- Established Timing II ---
[v]800x600@72 [v]800x600@75
[v]832x624@75 [v]1024x768@87
[v]1024x7680@60 [v]1024x7680@70
[v]1024x7680@75 [v]1280x1024@75

--- Manufacturer Timing ---
[v]1152x870@75

--- Standard Timing 1 ---
Horizontal Active Pixel = 1280
Vertical Active Pixel = 1024
Image Aspect Ratio = 5:4
Refresh Rate = 75

--- Standard Timing 2 ---
Horizontal Active Pixel = 1280
Vertical Active Pixel = 1024
Image Aspect Ratio = 5:4
Refresh Rate = 85

--- Standard Timing 3 ---
Horizontal Active Pixel = 1600
Vertical Active Pixel = 1200
Image Aspect Ratio = 4:3
Refresh Rate = 60

--- Standard Timing 4 ---
Horizontal Active Pixel = 1024
Vertical Active Pixel = 768
Image Aspect Ratio = 4:3
Refresh Rate = 85

--- Standard Timing 5 ---
Horizontal Active Pixel = 800
Vertical Active Pixel = 600
Image Aspect Ratio = 4:3
Refresh Rate = 85

--- Standard Timing 6 ---
Horizontal Active Pixel = 640
Vertical Active Pixel = 480
Image Aspect Ratio = 4:3
Refresh Rate = 85

--- Standard Timing 7 ---
Horizontal Active Pixel = 1152
Vertical Active Pixel = 864
Image Aspect Ratio = 4:3
Refresh Rate = 70

--- Standard Timing 8 ---
Horizontal Active Pixel = 1280
Vertical Active Pixel = 960
Image Aspect Ratio = 4:3
Refresh Rate = 60

*** Detail Timings/Monitor Descriptors ***

--- BK0.Detail Timing1 ---

Pixel Clock(MHz) = 74.250
H/V Active = 1280 / 720
H/V Blanking = 370 / 30
H/V Sync Offset = 110 / 5
H/V Sync Width = 40 / 5
H/V Image Size(mm) = 519 / 324
Scanning Mode = Non interlace
Stereo = Normal display no stereo
Sync Type = Digital Seperate
H/V Sync Polarity = Positve/Positive

Monitor Serial Number = 505-709990100
Monitor Name = VP81_SID

--- Monitor Range Limits ---
Min Vertical Rate = 56 Hz
Max Vertical Rate = 76 Hz

Mn Horizontal Rate = 30 KHz
Max Horizontal Rate = 83 KHz

Max Pixel Clock Rate = 170 MHz
2nd Timing Formula = Not supported

--- DTV Monitor Support ---
Block Tag = 2, CEA 861 Extension
Revision = 3
Underscan = Not Supported
Basic Audio = Supported
RGB/YCbCr444 = Supported
RGB/YCbCr422 = Supported
Native Format Number = 1

--- Audio Data Block ---
Audio Format = Linear PCM
Sampling Rate(KHz) = 32/44.1/48/96/192
Max number of channels = 8
Bit per Sample(bit) = 16/20/24

--- Video Data Block ---
1920x1080p 59/60 16:9 is Native
1280x720p 59/60 16:9
 720x480p 59/60 16:9
 720x576p 50   16:9
 640x480p 59/60 4:3
1280x720p 50   16:9
 720x576p 50   4:3
1440x480i 59/60 16:9
1920x1080i 59/60 16:9
1440x480i 59/60 4:3
1920x1080p 29/30 16:9
1920x1080i 50   16:9
1440x576i 50   4:3

--- Vendor Specific Data Block ---
VSDB block size = 6
IEEE Registration Id = 0x000C03
CEC Physical Address A.B.C.D =
   1 . 0 . 0 . 0
Supports_AI = Supported
Deep Color(bit) = Not Supported
YCbCr444 Deep Color = Not Supported
DVI Dual Link = Not Supported

--- Speaker Allocation Data Block ---
Speaker Allocation =
 FL/FR LFE FC RL/RR RLC/RRC

--- BK1.Detail Timing1 ---
Pixel Clock(MHz) = 74.250
H/V Active = 1280 / 720
H/V Blanking = 370 / 30

H/V Sync Offset = 110 / 5
H/V Sync Width = 40 / 5
H/V Image Size(mm) = 488 / 274
Scanning Mode = Non interlace
Stereo = Normal display no stereo
Sync Type = Digital Seperate
H/V Sync Polarity = Positve/Positive

--- BK1.Detail Timing2 ---
Pixel Clock(MHz) = 27.000
H/V Active = 720 / 576
H/V Blanking = 144 / 49
H/V Sync Offset = 12 / 5
H/V Sync Width = 64 / 5
H/V Image Size(mm) = 488 / 274
Scanning Mode = Non interlace
Stereo = Normal display no stereo
Sync Type = Digital Seperate
H/V Sync Polarity = Negative/Negative

--- BK1.Detail Timing3 ---
Pixel Clock(MHz) = 27.000
H/V Active = 720 / 480
H/V Blanking = 138 / 45
H/V Sync Offset = 16 / 9
H/V Sync Width = 62 / 6
H/V Image Size(mm) = 488 / 274
Scanning Mode = Non interlace
Stereo = Normal display no stereo
Sync Type = Digital Seperate
H/V Sync Polarity = Negative/Negative

--- BK1.Detail Timing4 ---
Pixel Clock(MHz) = 74.250
H/V Active = 1920 / 540
H/V Blanking = 280 / 22
H/V Sync Offset = 88 / 2
H/V Sync Width = 40 / 5
H/V Image Size(mm) = 488 / 274
Scanning Mode = Interlace
Stereo = Normal display no stereo
Sync Type = Digital Seperate
H/V Sync Polarity = Negative/Negative

--- BK1.Detail Timing5 ---
Pixel Clock(MHz) = 74.250
H/V Active = 1280 / 720
H/V Blanking = 700 / 30
H/V Sync Offset = 440 / 5
H/V Sync Width = 40 / 5
H/V Image Size(mm) = 488 / 274
Scanning Mode = Non interlace
Stereo = Normal display no stereo
Sync Type = Digital Seperate
H/V Sync Polarity = Positve/Positive

Raw Data
02 03 21 71 4D 90 04 03 //87 12 01 13 11 07 05 06 22 //8F 14 15 23 0F 57 07 83 4F //97 00 00 66 03 0C 00 10 00 //9F 80 01 1D 00 72 51 D0 1E //A7 20 6E 28 55 00 E8 12 11 //AF 00 00 1E 8C 0A D0 90 20 //B7 40 31 20 0C 40 55 00 E8 //BF 12 11 00 00 18 8C 0A D0 //C7 8A 20 E0 2D 10 10 3E 96 //CF 00 E8 12 11 00 00 18 01 //D7 1D 80 18 71 1C 16 20 58 //DF 28 25 00 E8 12 11 00 00 //E7 98 01 1D 00 BC 52 D0 1E //EF 20 B8 28 55 40 E8 12 11 //F7 00 00 1E 00 00 00 00 4F //FF

14 Protocol 3000 Syntax

The Kramer Protocol 3000 lets you control the device from any standard terminal software (for example, the Windows® HyperTerminal Application).

14.1 Host Message Format

Start	Address (optional)	Body	Delimiter
#	*device_id*@	Message	CR

14.2 Simple Command

Command string with only one command without addressing.

Start	Body	Delimiter
#	Command SP *Parameter_1,Parameter_2,…*	CR

14.3 Command String

Formal syntax with commands concatenation and addressing.

Start	Address	Body	Delimiter
#	*device_id*@	**Command_1** *Parameter1_1,Parameter1_2,...*| **Command_2** *Parameter2_1,Parameter2_2,...*| **Command_3** *Parameter3_1,Parameter3_2,...*|…	CR

14.4 Device Message Format

Start	Address (optional)	Body	delimiter
~	*device_id*@	Message	CR LF

14.5 Device Long Response

Echoing command.

Start	Address (optional)	Body	Delimiter
~	*device_id*@	Command SP [*Param1 ,Param2 ...*] result	CR LF

CR = Carriage return (ASCII 13 = 0x0D)

LF = Line feed (ASCII 10 = 0x0A)

SP = Space (ASCII 32 = 0x20)

14.6 Command Terms

Command
A sequence of ASCII letters ('A'-'Z', 'a'-'z' and '-').
Command and parameters must be separated by at least one space.

Parameters
A sequence of alphameric ASCII characters ('0'-'9','A'-'Z','a'-'z' and some special characters for specific commands). Parameters are separated by commas.

Message string
Every command entered as part of a message string begins with a **message starting character** and ends with a **message closing character**.
Note: A string can contain more than one command. Commands are separated by a pipe ('|') character.

Message starting character
'#' – For host command/query
'~' – For machine response or machine command performed by keystroke operation on the front panel or IR remote controller.

Device ID (Optional when directly connected to the device)
K-NET Device ID or MACHINE NUMBER followed by '@'
(ex. #02@CRLF)

Query sign
'?' follows some commands to define a query request.

All outputs sign
'*' defines all outputs.

Message closing character
CR – For host messages; carriage return (ASCII 13)
CRLF – For machine messages; carriage return (ASCII 13) + line-feed (ASCII 10)

Command chain separator character
When a message string contains more than one command, a pipe ('|') character separates each command.

Spaces between parameters or command terms are ignored.

14.7 Entering Commands

You can directly enter all commands using a terminal with ASCII communications software, such as HyperTerminal, Hercules, etc. Connect the terminal to the serial, Ethernet, or USB port on the Kramer device. To enter CR , press the Enter key.
(LF is also sent but is ignored by command parser).

For commands sent from some non-Kramer controllers like Crestron, some characters require special coding (such as, /X##). Refer to the controller manual.

14.8 Bi-directional definition

All commands are bi-directional. That is, if the device receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel or IR controller), then these codes are sent to the PC or other RS-232 / Ethernet / USB controller.

14.9 Command Forms

Some commands have short name syntax in addition to long name syntax to allow faster typing. The response is always in long syntax.

14.10 Command Chaining

Multiple commands can be chained in the same string. Each command is delimited by a pipe character ('|'). When chaining commands, enter the **message starting character** and the **message closing character** only once, at the beginning of the string and at the end.

Commands in the string do not execute until the closing character is entered.

A separate response is sent for every command in the chain.

14.11 Maximum String Length

64 characters

14.12 Backward Support

The **VP-81SID** supports the commands listed in Table 12.

Table 12: Communication Commands

Command	Parameters	Description
#		Protocol handshaking
MODEL?		Read device model
VERSION?		Read device firmware version
SN?		Read device serial number
NAME?		Get device name
MACH-NUM		Set the machine num
BUILD-DATE?		Read device build date
PROT-VER?		Read device protocol version
HELP		List of commands
RESET		Reset device
LDFW		Load firmware file – by application only
LDFPGA		Load FPGA binary file – by application only
LOCK-FP	1/0 (1=lock on,0=lock off)	Set lock for front panel
LOCK-FP?		Get lock state
NET-IP		Set IP address
NET-IP?		Get IP address

SET Commands		
AV/V/ VID	in>out	Set current <input> and <output>
VOLUME, VOL	-63db to 0db, or +/- chars (exp: VOL +, VOLUME -)	Set Volume
PRIO	input, priority	Set priority [1..10] to input [1..10]
MUTE	1/0 (1=mute on,0=mute off)	Set audio mute for device
IREN		Enable/Disable IR driver
VID-TYPE	input, sid-x1 input	Switch inputs on SID-X1 via VP-81SID (as described in Section 8.1.6)

GET Commands		
AV?/V?/VID?	out	Get current input-to-output routing setting
VOLUME?/ VOL?		Get Volume
MUTE?		Get audio mute state
VID-RES?	Stage (in\out), num	Get input video resolution
VID-TYPE?	Stage (in\out), num	Get input video type
IN-STATE?	In	Get input information for <input [1..10]> ->
GEDID?	Stage (in/out), num	Clock [ON/OFF], State [TOUT/ACT/MUTE], Priority [0..11]
FPGA-VER?	Id	Get EDID info for stage [in/out]
IREN?		Get FPGA version

14.12.1

Command Name	Short Cmd	Command Type	Permission
#		Common-mandatory	End User
Protocol handshaking			
Syntax			
#CR			
Response			
~nn@SP **OK** CR LF			
Parameters			
Notes			
Use to validate protocol 3000 connection and to get machine number.			

14.12.2 MODEL?

Command Name	Short Cmd	Command Type	Permission
MODEL?		Common-mandatory	End User
Read device model			
Syntax			
#**MODEL?** CR			
Response			
~nn@**MODEL** SP *model_name* CR LF			
Parameters			
model_name – String of printable ASCII chars (up to 19 chars).			
Notes			

14.12.3 VERSION?

Command Name	Short Cmd	Command Type	Permission
VERSION?		Common-mandatory	End User
Reset device serial number			
Syntax			
#**VERSION?** CR			
Response			
~nn@**VERSION** SP *firmware_version* CR LF			
Parameters			
firmware_version – Format: XX.XX.XX.XXXX where the digits group are: Major.Minor.Build.Revision			
Notes			

14.12.4 SN?

Command Name	Short Cmd	Command Type	Permission
SN?		Common-mandatory	End User
Reset device serial number			
Syntax			
#**SN?** CR			
Response			
~nn@**SN** SP *serial_number* CR LF			
Parameters			
serial_number – 11 decimal digits. Assign by Kramer factory.			
Notes			
For new products with 14 digits serial we kept only the last 11.			

14.12.5 NAME?

Command Name	Short Cmd	Command Type	Permission
NAME?		Common (Ethernet)	End User
Get machine (DNS) name			
Syntax			
#**NAME?** CR			
Response			
~nn@**NAME** SP *machine_name* CR LF			
Parameters			
machine_name – String of up to 14 alpha-numeric chars (can include hyphen, not in beginning or end).			
Notes			
The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).			

14.12.6 MACH-NUM

Command Name	Short Cmd	Command Type	Permission
MACH-NUM		Common	End User
Set Machine number			
Syntax			
#**MACH-NUM** SP *machine_number* CR			
Response			
~nn@**MACH-NUM** SP *machine_number* **OK** CR LF			
Parameters			
machine_number – New machine number to device			
Notes			
Some devices will not get the new machine number until restart the device. Some devices can change machine number only from dip-switches			

14.12.7 BUILD-DATE?

Command Name	Short Cmd	Command Type	Permission
#**BUILD-DATE?** CR			
Response			
~nn@**BUILD-DATE** SP *date* SP *time* CR LF			
Parameters			
date – Format: YYYY/MM/DD where YYYY = Year. MM = Month. DD = Day. ***time*** – Format: hh:mm:ss where hh = hours. mm = minutes. ss = secondes.			
Notes			

14.12.8 PROT-VER?

Command Name	Short Cmd	Command Type	Permission
PROT-VER?		Common-mandatory	End User
Read device model			
Syntax			
#**PROT-VER?** CR			
Response			
~nn@**PROT-VER** SP **3000:***version* CR LF			
Parameters			
Version – Format: XX.XX where X is decimal digits.			
Notes			
Version number need to reference to version of "Protocol 3000 Extended" document.			

14.12.9 HELP

Command Name	Short Cmd	Command Type	Permission
HELP		Common-mandatory	End User
Get commands list or help for specific command			
Syntax			
2 options: 1. #**HELP** CR 2. #**HELP** SP *command_name* CR			
Response			
1. Multi-line: ~nn@**Device available protocol 3000 commands**: CR LF *command*, SP *command*… CR LF **To get help for command use : HELP (COMMAND_NAME)** CR LF 2. Multi-line: ~nn@**HELP** SP *command*: CR LF *description* CR LF **USAGE**:*usage* CR LF			
Parameters			
Notes			

14.12.10 RESET

Command Name	Short Cmd	Command Type	Permission
RESET		Common-mandatory	Administrator
Reset device			
Syntax			
#**RESET** CR			
Response			
~nn@**RESET** SP **OK** CR LF			
Parameters			
Notes			
If device connected by USB, it's recommend to disconnect the connection immediately after operating this command, to eliminate port locking because USB bug in windows (if port was locked anyway, disconnect and reconnect the cable and then try to open port again).			

14.12.11 LDFW

Command Name	Short Cmd	Command Type	Permission
LDFW		Common - Packets	Admin
Load new Firmware file			
Syntax			
Step 1: #**LDFW** SP *size* CR Response 1: ~nn@**LDFW** SP *size* SP **READY** CR LF or ~nn@**LDFW** SP **ERRnn** CR LF Step 2: If **ready** was received, send *FIRMWARE_DATA* [P] Response 2: ~nn@**LDFW** SP *size* SP **OK** CR LF			
Parameters			
size –Size of firmware data that will send. *FIRMWARE_DATA* - HEX or KFW file in protocol packets (Apendix A)			
Notes			
In most devices firmware data will saved to device flash memory, but device will not update until receiving command "UPGRADE" and restart. [P] Protocol Packet reference: Appendix A.			

14.12.12 LDFPGA

Command Name	Short Cmd	Command Type	Permission
LDFPGA		Common - Packets	Admin
Load new FPGA file			
Syntax			
Step 1: #LDFPGA SP size SP CRC SP ID SP CRC_Check CR Response 1: ~nn@LDFPGA SP READY CR LF or ~nn@LDFW SP ERRnn CR LF Step 2: If ready was received, send FPGA_DATA P Response 2: ~nn@LDFPGA SP size SP OK CR LF			
Parameters			
size *–Size of firmware data that will send.* *CRC – FPGA CRC* *ID – FPGA ID (if there are more than one FPGA in Device, 1 –otherwise)* *CR_Check – if CRC test needed flag* *FPGA_DATA - HEX or KFW file in protocol packets*			
Notes			
[P] Protocol Packet reference: Appendix A.			

14.12.13 LOCK-FP

Command Name	Short Cmd	Command Type	Permission
LOCK-FP		Common	End User
Lock front panel			
Syntax			
Option 1: #**LOCK-FP** SP *lock_mode* CR Option 2: #**LOCK-FP** SP *device_id, lock_mode* CR			
Response			
Option 1: ~nn@**LOCK-FP** SP *lock_mode* SP **OK** CR LF Option 2: ~**01**@**LOCK-FP** SP *device_id,lock_mode* SP **OK** CR LF			
Parameters			
lock_mode – '0' or 'off' to unlock front panel buttons. '1' or 'on' to lock front panel buttons. ***device_id*** – For K-Net controllers, select the buttons panel to lock. Locking is allowed only from the master.			
Notes			

14.12.14 LOCK-FP?

Command Name	Short Cmd	Command Type	Permission
LOCK-FP?		Common	End User
Get lock state of front panel			
Syntax			
Option 1: #**LOCK-FP?** CR Option 2: #**LOCK-FP?** SP *device_id* CR			
Response			
Option 1: ~nn@**LOCK-FP** SP *lock_mode* CR LF Option 2: ~**01**@**LOCK-FP** SP *device_id, lock_mode* CR LF			
Parameters			
lock_mode – 'OFF' for unlocked front panel. 'ON' for locked front panel. ***device_id*** – For K-Net controllers, select the buttons panel to get lock state. State is available only from the master.			
Notes			

14.12.15 NET-IP

Command Name	Short Cmd	Command Type	Permission
NET-IP	NTIP	Ethernet	Administrator
Set device IP address			
Syntax			
#**NET-IP** SP *ip_address* CR			
Response			
~nn@ **NET-IP** SP *ip_address* SP **OK** CR LF			
Parameters			
ip_address – format: xxx.xxx.xxx.xxx			
Notes			
For proper settings consult your network administrator			

14.12.16 NET-IP?

Command Name	Short Cmd	Command Type	Permission
NET-IP?	NTIP?	Ethernet	End User
Get device IP address			
Syntax			
#**NET-IP?** CR			
Response			
~nn@ **NET-IP** SP *ip_address* CR LF			
Parameters			
ip_address – format: xxx.xxx.xxx.xxx where x is decimal digit.			
Notes			

14.12.17 AV

Command Name	Short Cmd	Command Type	Permission
AV		Switch	End User
Switch Audio and Video			
Syntax			
#**AV** SP *in>out, in>out, ...* CR			
Response			
~nn@**AV** SP *in>out, in>out, ...* CR LF			
Parameters			
In - input number or '0' to disconnect output *'>'* = Connection character between in and out parameters *out* = Output number or '*' for all outputs			
Notes Out = 1 (TP output) Out = 2 (HDMI output)			

14.12.18 VID

Command Name	Short Cmd	Command Type	Permission
VID	V	Switch	End User
Switch Video			
Syntax			
#**VID** SP *in>out, in>out,...* CR			
Response			
~nn@**VID** SP *in>out* CR LF ~nn@**VID** SP *in>out* CR LF ...			
Parameters			
In - input number or '0' to disconnect output *'>'* = Connection character between in and out parameters *out* = Output number or '*' for all outputs			
Notes			
When AFV switching mode is active, this command also switches Audio and the unit replies with command ~AV.			

14.12.19 VID?

Command Name	Short Cmd	Command Type	Permission
VID?	V?	Switch	End User
Get Video Switch Stat			
Syntax			
#**VID?** SP *out* CR #**VID?** SP * CR			
Response			
~nn@**VID** SP *in>out* CR LF ~nn@**VID** SP *in>1 , in>2 ,* ... CR LF			
Parameters			
in - input number or '0' to disconnect output *'>'* = Connection character between in and out parameters *out* = Output number or '*' for all outputs			
Notes			

14.12.20 VOLUME

Command Name	Short Cmd	Command Type	Permission
VOLUME	VOL	Audio	End User
Set simple audio volume			
Syntax			
#**VOLUME** SP *out_channel, volume* CR			
Response			
~nn@**VOLUME** SP *out_ channel, volume* CR LF			
Parameters			
out_channel = Output # *volume* = Audio parameter in Kramer units, minus sign precedes negative values. ++ increase current value, -- decrease current value			
Notes			
For set / get "input" level or audio level in other amplifier stage use command #AUD-LVL / #AUD-LVL? – set / get audio level in specific amplifier stage			

14.12.21 VOLUME?

Command Name	Short Cmd	Command Type	Permission
VOLUME?	VOL?	Audio	End User
Get simple audio volume			
Syntax			
#**VOLUME?** SP *out_channel* CR			
Response			
~nn@**VOLUME** SP *out_ channel, volume* CR LF			
Parameters			
out_channel = Output # *volume* = Audio parameter in Kramer units, minus sign precedes negative values. ++ increase current value, -- decrease current value			
Notes			
For set / get "input" level or audio level in other amplifier stage use command #AUD-LVL / #AUD-LVL? – set / get audio level in specific amplifier stage			

14.12.22 PRIO

Command Name	Short Cmd	Command Type	Permission
PRIO		Device specific	Administrator
Syntax		**Response**	
PRIO INPUT ,PRIORITY		PRIO INPUT ,PRIORITY OK	
Description		**Notes**	
Set input Priority		INPUT – 1…10 PRIORITY - 1..10	

14.12.23 MUTE

Command Name	Short Cmd	Command Type	Permission
MUTE		Audio	End User
Set audio MUTE mode			
Syntax			
#**MUTE** SP *channel, mute_mode* CR			
Response			
~nn@**MUTE** SP *channel, mute_mode* CR LF			
Parameters			
channel = Output # *mute_mode* = '0' or 'OFF' / '1' or 'ON'			
Notes			

14.12.24 MUTE?

Command Name	Short Cmd	Command Type	Permission
MUTE?		Audio	End User
Get audio MUTE mode status			
Syntax			
#**MUTE?** SP *channel* CR			
Response			
~nn@**MUTE** SP *channel, mute_mode* CR LF			
Parameters			
channel = Output # *mute_mode* = '0' or 'OFF' / '1' or 'ON'			
Notes			

14.12.25 IREN

Command Name	Short Cmd	Command Type	Permission
IREN		Common	End User
Syntax		**Response**	
IREN 1/0		IREN 1/0 OK	
Description		**Notes**	
Enable/ Disable IR control		1/0= On OR Off	

14.12.26 VID-TYPE

Command Name	Short Cmd	Command Type	Permission
VID-TYPE		Device specific	End User
Syntax		**Response**	
VID-TYPE INPUT , SID-X1 INPUT		VID-TYPE INPUT , INPUT TYPE , IS_X1_INPUT	
Description		**Notes**	
Switch SID-X1 inputs remotely via VP-81SID		INPUT - input No. of switcher, where HDMI=0, DP=1, DVI=2, VGA=3 SID-X1 INPUT – input No. of SID-X1 to switch to INPUT_TYPE – VGA / HDMI / DVI / DP IS_X1_INPUT - 0/1 report if connected module is SID-X1 or not	

14.12.27 IREN?

Command Name	Short Cmd	Command Type	Permission
IREN?		Common	End User
Syntax		**Response**	
IREN?		IREN 1/0	
Description		**Notes**	
Get IR control current status		1/0= On OR Off	

14.12.28 VID-RES?

Command Name	Short Cmd	Command Type	Permission
VID-RES?		Device specific	End User
Syntax		**Response**	
VID-RES? INPUT/OUTPUT , NUMBER		VID-RES IN/OUT , INPUT NUM , HSIZE , VSIZE , I/P, REF.RATE	
Description		**Notes**	
Get input/output resolution information		IN/OUT - stage input/output (string) INPUT NUM– input (output) No. HSIZE - pixel number VSIZE – lines number I/P - interlaced/ progressive REF.RATE – refresh rate	

14.12.29 VID-TYPE?

Command Name	Short Cmd	Command Type	Permission
VID-TYPE?		Device specific	End User
Syntax		**Response**	
VID-TYPE? INPUT		VID-TYPE INPUT , INPUT TYPE , IS_X1_INPUT	
Description		**Notes**	
Get current module type connected to switcher input		INPUT - input No. of switcher SID-X1 INPUT – input No. of SID-X1 to switch to INPUT_TYPE – VGA / HDMI / DVI / DP IS_X1_INPUT - 0/1 report if connected module is SID-X1 or not	

14.12.30 IN-STATE?

Command Name	Short Cmd	Command Type	Permission
IN-STATE?		Device specific	End User
Syntax		**Response**	
IN-STATE? INPUT NUM		IN-STATE? INPUT NUM , TMDS_CLK , STATE , PRIO	
Description		**Notes**	
Get input status		INPUT_NUM – input No. TMDS_CLK - clock presence on input STATE – MUTE / ACT (active)/ TOUT (timedouted) PRIO - current priority	

14.12.31 GEDID

Command Name	Short Cmd	Command Type	Permission
GEDID		Common	End User
Read EDID data			
Syntax			
#**GEDID** SP *eeprom_id* CR			
Response			
Multi line response: ~nn@**GEDID** SP *eeprom_id, size* CR LF *Edid_data* CR LF ~nn@**GEDID** SP *eeprom_id* SP **OK** CR LF			
Parameters			
eeprom_id – EEPROM to get the EDID from ***size*** – Device send this parameter in response. Size of EDID that will print. ***edid_data*** – EDID data as stream of bytes.			
Notes			

14.12.32 FPGA-VER?

Command Name	Short Cmd	Command Type	Permission
FPGA-VER? <?>		Device specific	End User
Syntax		**Response**	
FPGA-VER? ID		FPGA-VER? FPGA version number , ID	
Description		**Notes**	
Request FPGA version by FPGA ID (optional)			

14.12.33 SECUR

Command Name	Short Cmd	Command Type	Permission
SECUR		Security	Administrator
Start/Stop security			
Syntax			
#**SECUR** SP *security_mode* CR			
Response			
~nn@**SECUR** SP *security_mode* SP **OK** CR LF			
Parameters			
security_mode – 1 or ON to enable security. 0 or OFF to disable security.			
Notes			
Permissions system work only if security was enabled (by "SECUR" command)			

14.12.34 SECUR?

Command Name	Short Cmd	Command Type	Permission
SECUR?		Security	Administrator
Get current security state			
Syntax			
#**SECUR?** CR			
Response			
~nn@**SECUR** SP *security_mode* CR LF			
Parameters			
security_mode –ON if security enabled. OFF if security disabled.			
Notes			
Permissions system work only if security was enabled (by “SECUR” command)			

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Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

P/N: 2900-000750 Rev: 7

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
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